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ABSTRACT

This document presents the results of testing upon two groups of graduate-level, preservice, elementary school, student teachers to compare the cost and effectiveness of a performance based teacher education program with a subject-centered teacher education program at the San Diego State University. Six null hypotheses were tested to determine significance of difference in (1) knowledge levels on approved program objectives for the two groups; (2) student teacher performance as measured by the Reciprocal Category System for the two groups; (3) the degree of individualized instruction as measured by the Descriptive Observational Record for Individualization of Instruction Inventory for the two groups; (4) children's perception of teacher performance for the two groups; (5) the costs of the subject-centered program versus the costs of the competency-based program; and (6) the cost-effectiveness of each of the two programs. A follow-up study was conducted on all employed graduates of both programs, utilizing the same measurements to determine if the preservice training in teaching skills was implemented in the graduates' classrooms. The competency-based program appeared to have been operating in a fashion superior to the subject-centered program in all measures under study. The cost-effectiveness analysis identified six additional benefits for the competency-based program: student knowledge, individualized instruction, fosterage of self-esteem, rapport, unreasonable negativity, and interactional competence. The follow-up study continued to support the results of the original study. (MJB)

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# A COST-EFFECTIVENESS ANALYSIS OF COMPETENCY-BASED AND NON-COMPETENCY-BASED TEACHER EDUCATION AT SAN DIEGO STATE UNIVERSITY

Donald Ferrin Enos
The University of Texas at Austin, 1975

## The Problem

The purpose of this study was to compare the cost and effectiveness of a competency-based teacher education program with a subject-centered teacher education program in the preparation of elementary school teachers.

## The Procedure

The sample consisted of two groups of graduate, pre-service student-teachers registered in a fifth year elementary teacher education credential program. In addition, fifteen university professors, five instructional supervisors, and four thousand two hundred and sixty-seven elementary school children were involved in the study.

Six null hypotheses were tested to determine significance of difference in:

1. The knowledge level on approved program objectives for student-teachers in the subject-centered group versus the competency-based group.

2. The student-teaching performance as measured by the Reciprocal Category System for student-teachers in the two groups.

3. The degree of individualized instruction as measured by the Descriptive Observational Record for Individualization of Instruction Inventory for student-teachers in the two groups.

4. Children's perception of teacher performance as measured by the Student Evaluation of Teaching Instrument for student-teachers in the two groups.

5. The costs of the subject-centered program versus the costs of the competency-based program.

6. The cost-effectiveness of the subject-centered program versus the cost-effectiveness of the competency-based program.

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A follow-up study was conducted on all employed graduates, of both programs, utilizing the same measurements of teacher effectiveness. The purpose of the follow-up was to determine if the pre-service training in teaching skills was implemented by the graduates in their own classrooms.

All teacher effectiveness data obtained were analyzed using t-tests and chi-squares as an indication of whether the difference between group means and scores was significant at .05, .01, or .001 levels.

Cost-effectiveness methodology was applied to identified teacher effectiveness measures and program costs to select the "best" system from the two alternatives.

## The Findings

The first hypothesis was rejected as the competency-based student-teachers were able to demonstrate a higher level of knowledge at the .001 level of significance. Hypothesis two was rejected based on the evidence that student-teachers in the competency-based program were able to demonstrate a difference in verbal interaction within their classrooms. Hypothesis three was rejected as the competency-based group of student-teachers demonstrated higher levels of individualized instruction within their classrooms. Hypothesis four was rejected as the 4,267 elementary school children reported perceiving a difference in student-teacher performance favoring the competency-based group. The fifth hypothesis was rejected as the absolute costs of the competency-based program were $425,525.00 for research and development, implementation and annual operating phases while the costs for the subject-centered program were unavailable and therefore set at $0.00. Hypothesis six was rejected also as the delta cost-effectiveness of the competency-based program was calculated to be $11,044.00 per student.

## Conclusions

The competency-based program at this university appears to have been operating in a fashion that was superior to the subject-centered program in all measures under study. The differences found were consistently highly significant at the .001 level.

The cost-effectiveness analysis identified six additional benefits for the competency-based program which were valued at $15,971.00 per student. They were--student knowledge, individualized instruction, fosterance of self-esteem, rapport, unreasonable negativity, and inter-actional competence.

The follow-up study continued to support the results of the original study and limited the occurrence of a Hawthorne Effect.

TABLE I

RESULTS OF HYPOTHESIS I

| INSTRUMENT | SEMESTER | SIGMA | SCTE | NSD |
|---|---|---|---|---|
| SKATE | FALL | .001 | | |
| | SPRING | .001 | | |
| | YEAR | .001 | | |

TABLE II

RESULTS OF HYPOTHESIS II

| RATIO | MEASUREMENT PERIOD | SIGMA | SCTF | NSD |
|---|---|---|---|---|
| Warm/Cool | Fall '74 | .05 | | |
| | Spring '75 | .001 | | |
| | Year 74-75 | .001 | | |
| | Follow-up '75 | .001 | | |
| Accept/Correct | Fall '74 | .001 | | |
| | Spring '75 | .001 | | |
| | Year 74-75 | .001 | | |
| | Follow-up | .001 | | |
| Elicit/Initiate | Fall '74 | | | X |
| | Spring '75 | .001 | | |
| | Year 74-75 | .001 | | |
| | Follow-up | | | X |
| Student/Teacher - Talk | Fall '74 | .001 | | |
| | Spring '75 | .001 | | |
| | Year 74-75 | .001 | | |
| | Follow-up | | | X |
| Acceptance/ Rejection | Fall '74 | .001 | | |
| | Spring '75 | .001 | | |
| | Year 74-75 | .001 | | |
| | Follow-up '75 | .001 | | |

TABLE III

RESULTS OF HYPOTHESIS III

Individualization

Note — SIGMA - emphasizes individualization

| CATEGORY | SEMESTER | CBTE | SCTE | NSD |
|---|---|---|---|---|
| Intra-Class Grouping | Fall | | | X |
| | Spring | .001 | | |
| | Year | .001 | | |
| | Follow-up | .001 | | |
| Variety of Materials | Fall | | | X |
| | Spring | .001 | | |
| | Year | .001 | | |
| | Follow-up | .001 | | |
| Pupil Autonomy | Fall | .001 | | |
| | Spring | .001 | | |
| | Year | .001 | | |
| | Follow-up | .001 | | |
| Differentiated Assignments | Fall | .001 | | |
| | Spring | .001 | | |
| | Year | .001 | | |
| | Follow-up | .001 | | |
| Tutoring | Fall | .001 | | |
| | Spring | .001 | | |
| | Year | .001 | | |
| | Follow-up | .001 | | |
| Total Individualization of Instruction | Fall | .001 | | |
| | Spring | .001 | | |
| | Year | .001 | | |
| | Follow-up | .001 | | |

TABLE IV

RESULTS OF HYPOTHESIS IV

| FACTOR | SEMESTER | GRADE | CBTE | SCTE | NSD | NM |
|---|---|---|---|---|---|---|
| Stimulating Interacting Style | Fall | K | — | | X | |
| | Spring | K | .01 | | | |
| | Year | K | .05 | | | |
| | Follow-up | K | | | | X |
| | Fall | 1-3 | — | | X | |
| | Spring | 1-3 | .001 | | | |
| | Year | 1-3 | .001 | | | |
| | Follow-up | 1-3 | .01 | | | |
| Rapport | Fall | 4-6 | — | | X | |
| | Spring | 4-6 | .001 | | | |
| | Year | 4-6 | .001 | | | |
| | Follow-up | 4-8 | .01 | | | |
| Interactional Competence | Fall | 4-6 | — | | X | |
| | Spring | 4-6 | .001 | | | |
| | Year | 4-6 | .001 | | | |
| | Follow-up | 4-8 | .01 | | | |
| Unreasonable Negativity | Fall | K | — | | X | |
| | Spring | K | | | X | |
| | Year | K | | | X | |
| | Follow-up | K | | | | X |
| | Fall | 1-3 | — | .001 | | |
| | Spring | 1-3 | .001 | | | |
| | Year | 1-3 | .001 | | | |
| | Follow-up | 1-3 | .01 | | | |
| | Fall | 4-6 | — | | X | |
| | Spring | 4-6 | .001 | | | |
| | Year | 4-6 | .001 | | | |
| | Follow-up | 4-8 | .01 | | | |
| Posterance of Self-Esteem | Fall | K | — | | X | |
| | Spring | K | | | X | |
| | Year | K | | | X | |
| | Follow-up | K | | | | X |
| | Fall | 1-3 | — | | X | |
| | Spring | 1-3 | .001 | | | |
| | Year | 1-3 | .001 | | | |
| | Follow-up | 1-3 | .001 | | | |
| | Fall | 4-6 | — | | X | |
| | Spring | 4-6 | .001 | | | |
| | Year | 4-6 | .001 | | | |
| | Follow-up | 4-8 | .01 | | | |